

Sessional Test I – February, 2022

Semester II

Time: 90 minutes

Department: CSE

Title of the Course: Database Management Concepts

Max. Marks: 40

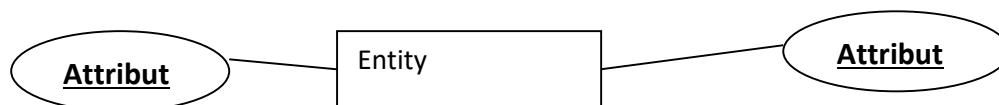
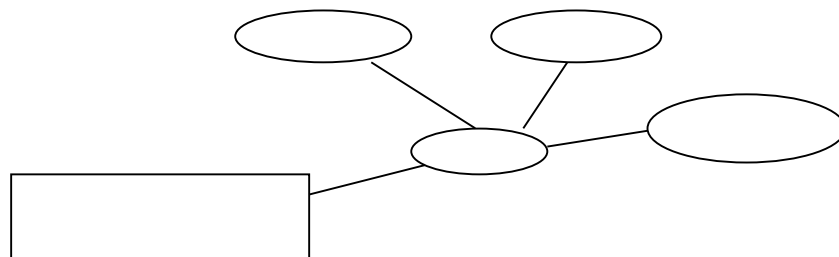
Course Code: CST101

Solution**Section-A****Ans. 1** a. (ii) b. (ii) c. (iv) d. (iii) e. (iii)**Section-B****Ans. 2** Degree: 3 and Cardinality: 4**Ans. 3.** Composite Key is a primary key composed of more than one attribute

Composite Attribute is an attribute that can be further subdivided into more attributes

Representation of Composite Key & Composite Attribute in an ER diagram:

Composite Key:-

**Composite Attribute:-****Ans. 4** A weak entity is one that meets two conditions:

- (a) An entity which does not has a sufficient key attribute
- (b) An entity can't exist without entity with which it has a relationship

Example of Weak Entity is:-

Strong Entity :- Loan (loan_number, amount)Weak Entity :- Payment (payment_no, payment_date, payment_amount)

Identifying Relationship:- loan_payment

Ans.5 It is used to remove the duplicate data and database anomalies from the relational table. Normalization helps to reduce redundancy and complexity by examining new data types used in the table. It is helpful to divide the large database table into smaller tables and link them using relationship. It avoids duplicate data or no repeating groups into a table. It reduces the chances for anomalies to occur in a database.

Ans.6

Relational selection in relation r with condition $A=B$ and $D>5$.

Ans. 7

Physical Data Independence	Logical Data Independence
Physical Data Independence modifies the physical schema without causing the application program to be rewritten.	Logical Data Independence modifies the logical schema without causing the application program to be rewritten.
Physical Data Independence is easy to achieve.	Logical Data Independence is difficult to achieve.
Modifications at the physical level are occasionally required.	Modifications at the logical level are necessary required.
At the second level	At the first level

Section-C

Ans. 8

Q8:

<p>R</p> <table> <tr><th>A</th><th>B</th></tr> <tr><td>a</td><td>b</td></tr> <tr><td>c</td><td>b</td></tr> <tr><td>d</td><td>e</td></tr> </table>	A	B	a	b	c	b	d	e	<p>S</p> <table> <tr><th>B</th><th>C</th></tr> <tr><td>b</td><td>c</td></tr> <tr><td>e</td><td>a</td></tr> <tr><td>b</td><td>d</td></tr> </table>	B	C	b	c	e	a	b	d
A	B																
a	b																
c	b																
d	e																
B	C																
b	c																
e	a																
b	d																

a) $R \cup S$

A	B
a	b
b	c
c	b
d	e
e	a
b	d

b) $R \cap S$

No data

c) $R - S$

A	B
a	b
c	b
d	e

d) $R \times S$

A	B	B	C
a	b	b	c
a	b	e	a
a	b	b	d
c	b	b	c
c	b	e	a
c	b	b	d
d	e	b	c
d	e	e	a
d	e	b	d

e) $S - R$

B	C
b	c
e	a
b	d

Ans. 9. Keys are very important part of Relational database model. They are used to establish and identify relationships between tables and also to uniquely identify any record or row of

data inside a table. A Key can be a single attribute or a group of attributes, where the combination may act as a key.

Types of Keys:

- Primary Key.
- Candidate Key.
- Super Key.
- Foreign Key.
- Composite Key.
- Alternate Key.
- Unique Key.

Ans. 10.

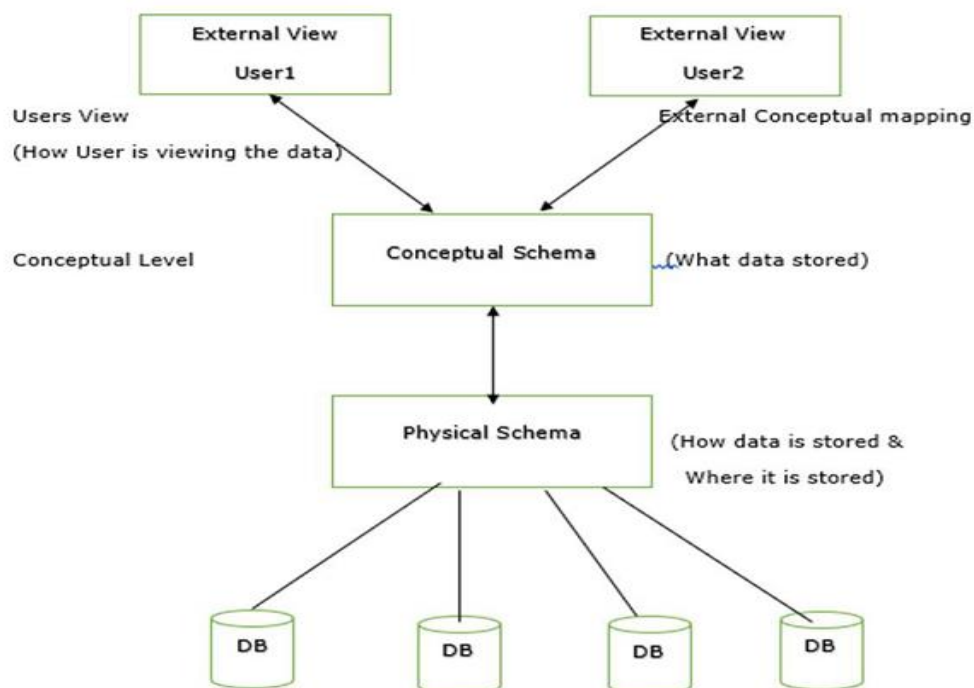
S.NO	Relational Algebra	Relational Calculus
1.	It is a Procedural language.	While Relational Calculus is Declarative language.
2.	Relational Algebra means how to obtain the result.	While Relational Calculus means what result we have to obtain.
3.	In Relational Algebra, The order is specified in which the operations have to be performed.	While in Relational Calculus, The order is not specified.
4.	Relational Algebra is independent of the domain.	While Relation Calculus can be domain-dependent.
5.	Relational Algebra is nearer to a programming language.	While Relational Calculus is not nearer to programming language.
6.	The SQL includes only some features from the relational algebra.	SQL is based to a greater extent on the tuple relational calculus.
7.	Relational Algebra is one of the languages in which queries can be expressed but the queries should also be expressed in	For a database language to be relationally complete., the query written in it must be

S.NO	Relational Algebra	Relational Calculus
	relational calculus to be relationally complete.	expressible in relational calculus.

Ans. 11 . Dr. E.F Codd rules are:

- Rule 0 – Foundation rule. ...
- Rule 1 – Rule of Information. ...
- Rule 2 – Rule of Guaranteed Access. ...
- Rule 3 – Rule of Systematic Null Value Support. ...
- Rule 4 – Rule of Active and online relational Catalog. ...
- Rule 5 – Rule of Comprehensive Data Sub-language. ...
- Rule 6 – Rule of Updating Views.
- Rule 7 – Rule of Set level insertion, update and deletion
- Rule 8 – Rule of Physical Data Independence
- Rule 9 – Rule of Logical Data Independence
- Rule 10 – Rule of Integrity Independence
- Rule 11 – Rule of Distribution Independence
- Rule 12 – Rule of Non Subversion

Ans. 11 b



External View

View 1 – Library User

Roll number, Name, Address, Book Number, Date of Issue,
Date of Return

View 2 – Account office

Roll Number, Name, Fees

Conceptual View

Conceptual View for view 1 and view 2 are –

Field Name	Data type(size)
Roll Number	Number(20)
Name	Char(20)
Address	varchar(20)
Book number	Number(20)
Date of Issue	varchar(20)
Date of return	varchar(20)

Internal View

Internal View on hard Disk

Stored Item	Length
Roll Number	Type=byte(20), offset(starting address) =20
Name	Type=byte(20), offset=20
Address	Type=byte(20), offset=20

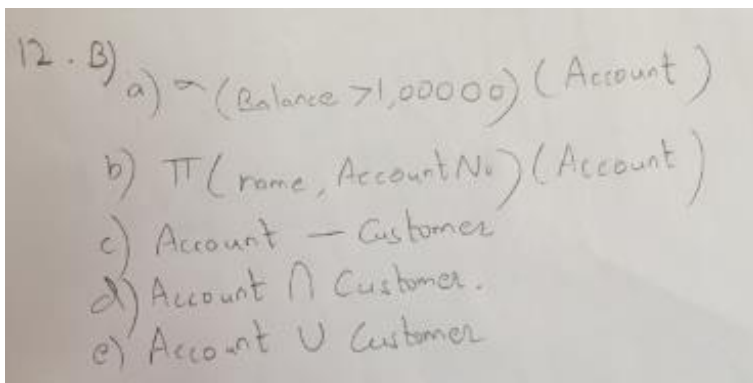
Section-D

Ans. 12.) Supervisor: independent and dependent: dependent
Seat: independent and reservation: dependent
Modem: dependent and PC: independent
Supplier: independent and supply: dependent
Employee: independent and salary: dependent

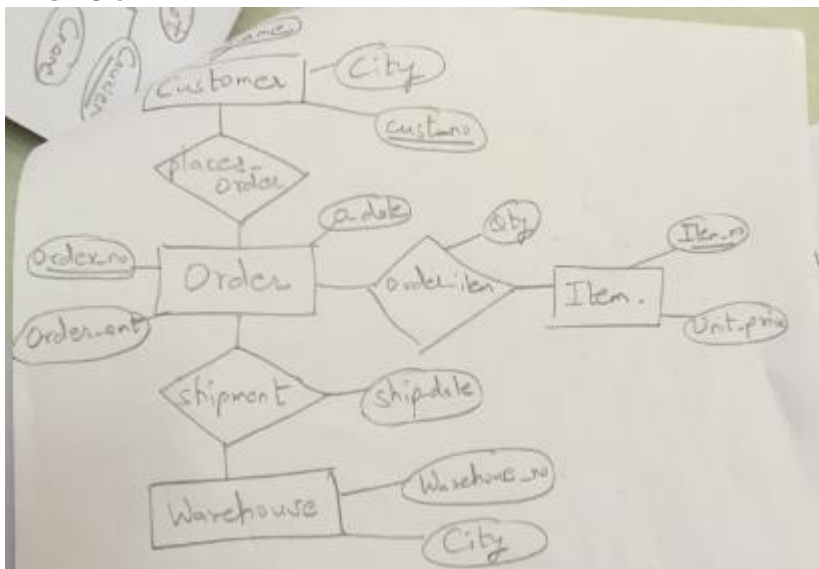
12. TRC:

a. $\{t \mid \text{Account}(t) \wedge t.\text{balance} > 1,00,000.00\}$

b. $\{t.\text{name}, t.\text{Accountno.} \mid \text{Account}(t)\}$



Ans.13.a



Ans.13.b

1. Files act locally whereas DBMS saves directly in a database
2. Saves in temporary locations where as DBMS in well-arranged and permanent data base locations
3. In File Sys., transactions are not possible where as various transactions like insert,delete,view,updating etc r possible in DBMS
4. Data will be accessed through single or various files where as in DBMS, tables (schema) is used to access data
5. A "File manager" is used to store all relationships in directories in File Systems where as a data base manager (administrator) stores the relationship in form of structural tables
6. Data in data bases are more secure compared to data in files!!

Advantage of DBMS over file system

There are several advantages of Database management system over file system. Few of them are as follows:

- No redundant data – Redundancy removed by data normalization
- Data Consistency and Integrity – data normalization takes care of it too
- Secure – Each user has a different set of access
- Privacy – Limited access
- Easy access to data
- Easy recovery
- Flexible